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Problems
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Monday, Sept. 11

8:30 AM – 10:00 AM

SESSION 6: Addressing Community and Customer Needs and Values

The Prospects of Desalination for Export in the Mexico-U.S. Border Region : A Survey of Mexican Opinion - Nicolas Pineda-Pablos, El Colegio de Sonora, Hermosillo, SON, México (co-authors: R.G. Varady, M. O. Wilder, S. Mumme, R. Figueroa-Mimbela, A.A. Zuñiga)

This paper reviews critically the prospects for tapping and desalinating water from a semi-closed, environmentally vulnerable sea--the Sea of Cortés in northern Mexico, just south of the United States border--and the consequent possibility of making the desalinated water available for international commerce. The binational Sonoran Desert, which envelops the northwestern part of the Sea of Cortés, is subject to a triple exposure: 1) it is naturally a desert where precipitation is scant (<300 mm/year) and water is a scarce resource, with the additional likelihood of rising temperatures and longer and drier droughts in the near future; 2) the region is divided by an international border between two countries with different languages, cultures, forms of government, and levels of development; and 3) the area has been rapidly urbanizing and industrializing during the last fifty years with the effect of increasing water demand. Several options, such as inter-basin transfers, have been implemented in the last 50 years. More recently, the possibility has emerged of transboundary bulk water trades of desalinated water. Proponents claim desalination is a drought-proof and sustainable solution to meeting future water demand, while critics cite potential environmental harm to marine life, the challenges of disposing safely of the brine byproduct, and the high cost of produced water. In any event, desalination in this area remains untested and at a minimum would need to navigate a number of legal, political, and financial challenges. One of the major obstacles is securing Mexican approval and acquiescence. In Mexico, this kind of project tends to be seen as a losing game, where the U.S. reaps all the benefits while Mexico bears the costs. The current geopolitical climate between the U.S. and Mexico runs counter to the transboundary region's recent tradition of collaboration and further complicates the situation. Since there is a dearth of research on Mexican perspectives on desalination in this area, an email survey was carried out among water experts and stakeholders in 2016 regarding the conditions that would facilitate this project and obstacles to it. Twenty-five responses were received (45%). Survey findings indicate that the main conditions are environmental and the main obstacles are political. After presenting survey findings, the paper devises some key guidelines and a critical path to follow in the near future if this project were to move forward.

Reuse of Grey Water for Non-Domestic Uses in Jordan - Sharon Megdal, The University of Arizona, Tucson, AZ, USA (co-authors: A. M. Ghrair, O.A. Al-Mashaqbeh)

Jordan faces a shortage in water supply and considered among the most water-stressed countries in the world in terms of per capita water availability. Therefore, opportunities to utilize treated water in place of or to substitute for freshwater supplies are of importance. In 2011, a pilot grey water collection and filtration system using local materials and solar power was designed, installed and operated in Deir-Alla

/ Jordan Valley through a funded research project by USAID and the Royal Scientific Society, in cooperation with the University of Arizona Water Resources Research Center, University of Arizona. The grey water was mixed with other water for use for agricultural purposes. Since 2011 until 2016, the pilot plant was clogged only once a time and was maintained. In 2016, two samples of grey water were collected from the pilot plant. Raw grey water (RGW) and treated grey water (TGW) were analysed to evaluate the performance of the filter. The results show that the Total Suspended Solids (TSS) of RGW and TGW are 436 and 2 mg/L, respectively. The TDS for both RGW and TGW are (980 and 803 mg/L). The total organic of the RGW is 900 mg/l. The total organic of the TGW is very low (6.97 mg/L). Based on the results of grey water analyses, It is important to mention here that the efficiency removal of TSS, COD, BOD5 and E-coli for the pilot filtration plant were 99.5%, 99.2%, 99.4% and 100%, respectively. These results show that the grey water quality matches reclaimed water standards for reuse. Moreover, the TGW was used in concrete production and showed promising results. Based on the results of this pilot plant, the authors conclude that governmental water management institutions, ministries, and authorities consider the use of filtered grey water in non-domestic uses as a step meeting the fresh water consumption needs of Jordan and other water-stressed regions of the world.

The Management of Hydro-diplomacy - Kira Russo, Global Water Policy Consulting, Flagstaff, AZ, USA (co-author: E. Hibbett)

Many articles address hydro-diplomacy as a way to share water across borders or political boundaries; however, few of these fully acknowledge that sharing water resources requires a requisite understanding of the values that competing societies hold for that water. This article examines the following questions: In what ways do water managers and policy makers approach societal values, and how do they address the politics of who gets water? Here we look at the relationships between community values of water, the capacities of water needed to attain those values, and water management. We address the ways in which water managers determine these community values, including which agree, and which are divergent or contradictory from other water uses. In addition, we concentrate on how these values are communicated to policy makers and what political interests drive policy makers toward and away from reconciling community values of water. Finally, we focus on ways in which these community values are addressed as important by their inclusion or exclusion from policy. A better understanding of both commodified and non-market values can lead to the attainment of water security among discrete societies and, therefore, to hydro-diplomacy.

Potential for Water Reuse in Agriculture: A Water-Energy-food Nexus Approach – Anne Dare, USAID, Washington, DC (co-authors: R. H. Mohtar, S. H. Lee)

Persistent water shortages and competing water demands in the Middle East and North Africa (MENA) present complex challenges to countries attempting to insure the food security of their growing population. The overall aim of this endeavor is to explore the nexus between cost of water treatment, water quality, productivity of water, energy consumption, soil and human health, and food production. We present a framework for quantifying the potential of treated wastewater to fill the water supply-demand gap for agriculture. Drawing upon both published and original treated wastewater quality data, this research identifies the future water supply-demand gap projected for MENA countries and provides an approach for quantifying the potential of treated wastewater to fill that gap. As demonstrated through case studies from Gabès, Tunisia and Doha, Qatar, treated wastewater may be efficiently consumed by the agricultural sector near the wastewater treatment facility. Such an approach may aid policy makers and farmers in identifying best management practices, wastewater treatment options, and efficient allocation of reclaimed waters.